

REMARKS

The Applicants respectfully request reconsideration in view of the following remarks and amendments. Claims 1, 3-6, 8-10, 12-15, 17, and 18 are amended. Claims 2, 7, 11, and 16 are canceled. Accordingly, claims 1, 3-6, 8-10, 12-15, 17, and 18 are pending in the application.

I. Claims Rejected Under 35 U.S.C. § 112

Claims 1 and 2 stand rejected under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In response, the Applicants have amended claim 1 to replace the term “means” to state “module” in order to clarify the claim language. The Applicants respectfully submit that claim 1 now recites sufficient structure and is not directed at invoking 35 U.S.C. § 112, 6th paragraph, means plus function consideration. Accordingly, reconsideration and withdrawal of the rejection of claim 1 are respectfully requested.

II. Claims Rejected Under 35 U.S.C. § 103

Claims 1-5, 7, 10-14, and 16 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 7,024,400 issued to Tokuda et al. (hereinafter “Tokuda”) in view of U.S. Patent Publication No. 2001/0032029 filed by Kauffman (hereinafter “Kauffman”).

The present invention is directed to a sentence classification device and method, in which unclassified sentences can be classified without requiring a procedure of model creation based on classification labels or other supervisor information. In the present invention, a mathematical procedure called DM decomposition method is applied to the sentence classification. The DM decomposition is a mathematical theory that is different from or dissimilar to DIM method or Fisher value theory. In addition, the present invention is characterized by the feature that the DM decomposition process is repeatedly executed. on a DT matrix and graph contraction (transform) is carried out by counting a DT matrix as a graph matrix to thus accomplish hierarchical clustering.

Claim 1, as amended, recites the following elements:

classification generation means module for generating classifications associated with the document set on the basis of a relationship between each cluster on the

transformed DT matrix obtained by said DT matrix transformation means module and said each document classified according to the clusters, wherein the classification generation module comprises a virtual representative document generation module for generating a virtual representative document, for each cluster on a transformed DT matrix, from a term of each document belonging to the cluster; and

large classification generation module for generating a large classification of documents from each document in a bottom-up manner by repeatedly performing hierarchical clustering processing of setting a DT matrix generated by said DT matrix generation module in an initial state, causing said virtual representative document generation module to generate a virtual representative document for each cluster on a transformed DT matrix generated from the DT matrix by said DT matrix transformation module, generating a new DT matrix used for next hierarchical clustering processing by adding the virtual representative document to the transformed DT matrix and deleting documents belonging to the cluster of the virtual representative document from the transformed DT matrix, and outputting, for said each cluster, information associated with the documents constituting the cluster as large classification data. (emphasis added).

The amendment incorporates the elements recited in claims 2 and 7. Accordingly, claims 2 and 7 are canceled and the Examiner's rejection is moot. In addition, elements related to "hierarchical clustering processing" are now included in claim 1. The amendment is substantially supported in the Specification as originally filed on page 44, lines 9-15.

The Examiner has deemed (see page 5 of the Office Action) the present invention as obvious in that although Tokuda does not explicitly teach the DM decomposition method the present invention will be apparent to persons of ordinary skill in the art when applying the document classification technique taught in Kauffman applied to Tokuda. However, as it will be apparent from the following discussion, the present invention does not resort to the model creation procedure using classification labels or other supervisor information. The present invention when repeating the DM decomposition process represents a technical idea which is completely different from the sentence classification technique of the prior art using the VLSI method or Fisher value as disclosed in the cited references.

In contrast, Tokuda is directed to a supervised document classification procedure using a differential latent semantics index (DSLII) approach in which a classification label is provided as a supervisor. Tokuda teaches to first construct a model for a collection of labeled documents having labels indicating their classifications by using a differential latent semantics index (DSLII) approach in which a classification label is provided as a supervisor. Tokuda teaches to first construct a model for a collection of labeled documents having labels indicating their

classifications by using a DLSI method derived from a latent semantics index (LSI) space-based approach. Tokuda also teaches to use the thus built model to classify a collection of unlabeled unclassified documents.

Moreover, Kauffman is directed to a technique for grasping the flow of goods, services and people in a firm as a network and optimizing the thus grasped network, like MRP (material requirements planning) technique. Kauffman teaches to provide a graph representation of target objects on the network using graph theory. According to Kauffman, the graph is analyzed and relationship among the goods, services and people is presented as the analysis result to allow to help the management staff of the firm make decisions.

For the reasons set forth above, neither Tokuda nor Kauffman teaches or suggests the feature of the present invention that the DM decomposition is repeatedly carried out to accomplish hierarchical clustering. Consequently, Tokuda in view of Kauffman fails to teach the elements of “generating a large classification of documents from each document in a bottom-up manner by repeatedly performing hierarchical clustering processing of setting a DT matrix generated by said DT matrix generation module in an initial state” and “generating a new DT matrix used for next hierarchical clustering processing by adding the virtual representative document to the transformed DT matrix,” as recited in claim 1. Thus, in view of the foregoing reasons, Tokuda in view of Kauffman fails to teach each element of claim 1. Therefore, it will be clearly understood that even with any combination of Tokuda and Kauffman, the present invention as recited in claim 1 cannot be accomplished. In addition, dependent claims 3-5 are patentable over the cited art because of their dependencies on claim 1. Lastly, as discussed previously, claims 2 and 7 are canceled and the Examiner’s rejection is moot. Accordingly, reconsideration and withdrawal of the rejection of claims 1 and 3-5 are respectfully requested.

With respect to claim 10, this claim, as amended, recites analogous elements to those in claim 1. Therefore, for at least the reasons mentioned in connection with claim 1, Tokuda in view of Kauffman fails to teach or suggest each element of claim 10. Moreover, dependent claims 12-14 are patentable over the art of record because of each of these claims depends on claim 10. Further, claims 11 and 16 are canceled and the Examiner’s rejection is moot. Accordingly, reconsideration and withdrawal of the rejection of claims 10 and 12-14 are respectfully requested.

Claims 6, 8, 9, 15, 17, and 18 stand rejected under 35 U.S.C. § 103(a) as being obvious over Tokuda in view of Kauffman in further view of U.S. Patent Publication No. 2001/0037324 filed by Agrawal et al. (hereinafter “Agrawal”).

With respect to claims 6, 8, 9, 15, 17, and 18, each of these claims depends on claim 1 or 10 and incorporates the limitations thereof. Thus, for at least the reasons mentioned in connection with claims 1 and 10, Tokuda in view of Kauffman fails to teach or suggest each element of these claims. In addition, Agrawal fails to teach the missing elements. Instead, Agrawal teaches to first provide a collection of labeled documents having labels indicating the contents of topics and a topic taxonomy and to construct therefrom a model based on the information on the frequency of terms occurring in the documents. According to Agrawal, a Fisher value is determined for the unclassified unlabeled documents based on the thus constructed model and the resultant Fisher value is used to determine where the unclassified documents will be added to classes in the taxonomy, and then classification is executed accordingly. Consequently, Agrawal fails to teach or suggest a DM decomposition that is repeatedly carried out to accomplish hierarchical clustering as required by the claims. Thus, in view of at least the foregoing reasons, Tokuda in view of Kauffman in further view of Agrawal fails to teach or suggest each element of claims 6, 8, 9, 15, 17, and 18. Accordingly, reconsideration and withdrawal of the rejection of claims 6, 8, 9, 15, 17, and 18 are respectfully requested.

CONCLUSION

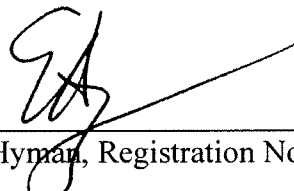
In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (310) 207 3800.

Respectfully submitted,

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